

1460-13



The
Bartlett-Graver
Water Softener
and Purifier in



Ice Plants

Wm. Graver Tank Works.

The Rookery: Chicago
Works: E. Chicago, Ind.





Representative
Installations

OF

BARTLETT-GRAVER
Water Softener & Purifier

IN

Ice Plants



DESIGNED AND BUILT BY

WM. GRAVER TANK WORKS

FOUNDED 1857

CHICAGO, ILLINOIS

WORKS: EAST CHICAGO, INDIANA

Established Under Present Management, 1872. Incorporated 1888

(C 1915)

BARTLETT-GRAVER WATER SOFTENER

Advantages of Softened Water in Distilled Water Ice Plants

Any manufacturing plant using boilers, needs and should have a Bartlett-Graver Water Softener and Purifier, if there is any appreciable quantity of scale-forming or corroding impurities in the water.

But an ice making plant needs this system for important special reasons of its own in addition to the requirements of the boiler plant.

In this booklet we refer to the ice-making plant using distilled water. A separate pamphlet entitled "Crystal Clear Ice from Raw Water" will be sent on request.

In the following pages we point the way to economies that will pay very large dividends on the whole cost of the installation of our system in any locality where there are even 6 grains of scale-forming solids in the feed water. Most feed water contains from 10 to 50 grains.

The Bartlett-Graver System will be installed in the plant of any responsible manufacturer at our own risk, subject to 60 days' trial, under specific guarantees which are written into the contract.

We analyze the feed water free of charge and make you a proposition in which we describe exactly what we will undertake to accomplish, and how much it will cost.

There is no guesswork on your part, or ours; and if there be any risk we take it.

Will you send a gallon of water and get our proposition?

WM. GRAVER TANK WORKS

The Rookery

Chicago

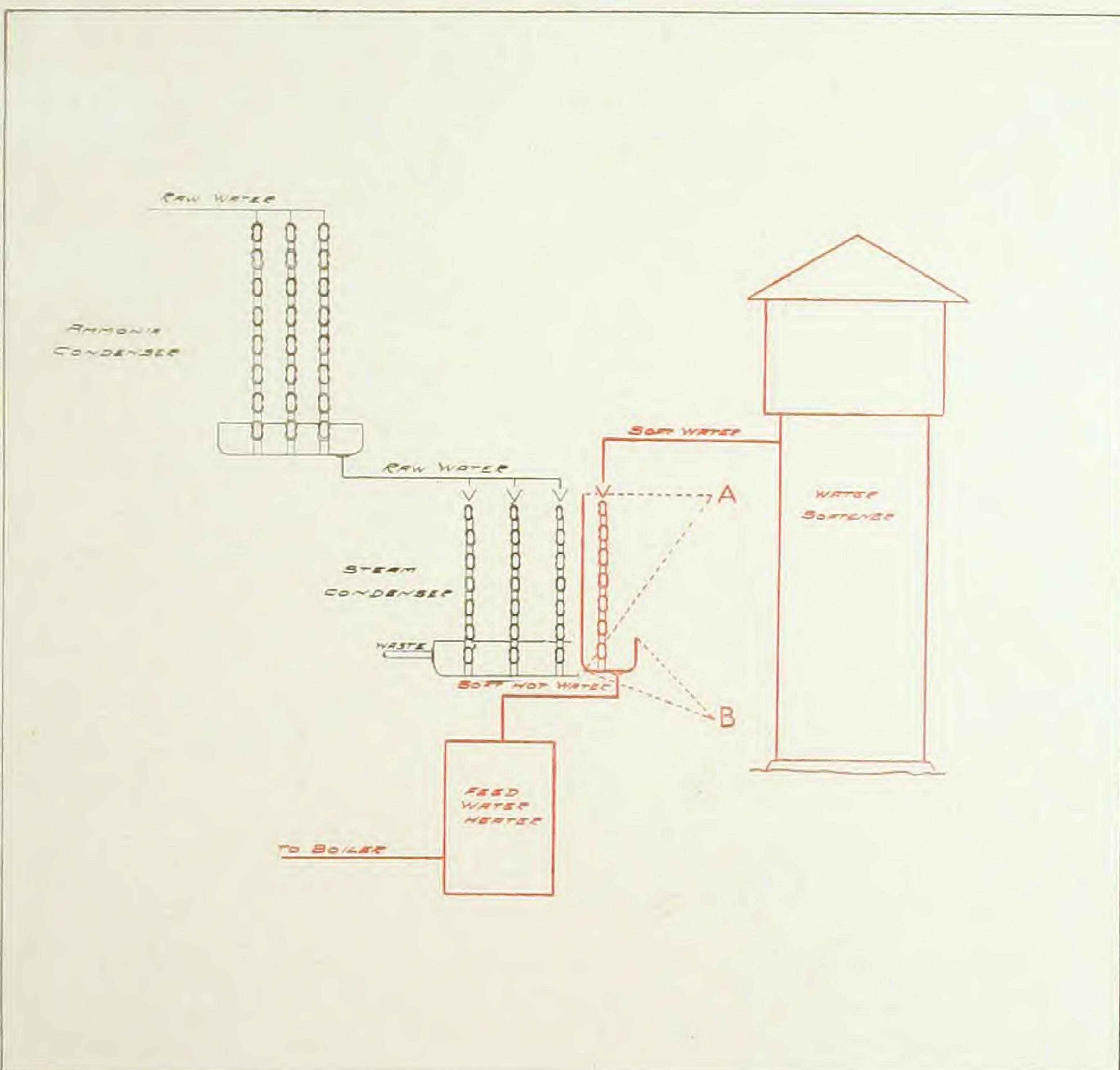
IN REPRESENTATIVE ICE PLANTS

Special Advantages

As operators of a distillation and freezing plant, you have special water problems on top of the regular boiler feed water problems, to contend with.

Let us consider these special problems first.

You should install a Bartlett-Graver apparatus so that its supply tank of purified, softened water is well above the level of your steam condensers, as shown in the following diagram:



By cutting off the end unit of the steam condensers with a shield, as shown at "A," the softened water from the Bartlett-Graver apparatus is allowed to trickle over this independent unit and is caught in the pan "B." From here it flows by gravity to the feed water heater whence it is pumped to the boiler.

BARTLETT-GRAVER WATER SOFTENER

This cold soft pure water condenses the steam without leaving in its wake the incrustation which always follows the use of hard condensing water, and it also puts to profitable use, heat otherwise wasted as the soft water from this pan flows into the feed water heater at about 140° F.

The raw water which is used over the ammonia condensers is used over the other units of the steam condensers and then allowed to run to waste or to cooling tower according to individual conditions.

Where local conditions prevent the use of this arrangement it is oftentimes advantageous to treat the water after it has passed the steam condensers and before it reaches the feed water heater.

Its absolute freedom from scale-forming impurities insures a clean feed water heater. Maximum efficiency in the feed-water heater is the result, with no more trouble with sludge, scale or pitting.

If you operate a closed-type feed water heater this freedom from scale, pitting and mud, is especially important.

But whether closed or open, a clean, scale-free heater means the largest possible condensation of steam, the hottest possible feed water, and the absence of the necessity of installing a duplicate feed water heating system to provide hot water for the boilers while cleaning.

The special importance to ice plants of pure boiler feed water, in addition to the features already explained, are:

1. The complete avoidance of the use of boiler compounds, which, in addition to being expensive and of little value, are so apt to be carried over with the steam and injure the ice.

2. No danger of any salts from the feed water going over to the ice in wet steam due to priming or foaming of the boilers.

3. Carbon dioxide wholly removed from the water, cutting down the reboiling time and expense to the minimum.

4. Softened water will keep evaporators clean, greatly increasing their efficiency and with very little shutting down for washing out. No mechanical cleaning is necessary.

5. Many plants are compelled to use expensive city water supply where they have wells on their own premises which are too hard to use for boiler water. In the majority of cases the water from these wells can be treated by the Bartlett-Graver System at a small fraction of the cost of city water delivering a treated water which is much better for boiler and general ice plant use than the average city supply.

IN REPRESENTATIVE ICE PLANTS

General Advantages

The special advantages just given will alone pay handsome dividends on the cost of a Bartlett-Graver System for any distilled water ice plant.

But, in addition to these there are the general advantages from the standpoint of increased boiler plant efficiency which in themselves would warrant any ice manufacturers to install the system.

The general and special advantages combined offer so alluring a series of money-making advantages that it is difficult for us to see how any wide-awake owner or engineer could hesitate a moment to accept an offer to test the system out at OUR risk.

Clean Boilers

By preventing the formation of scale within the boilers the coal consumption is very materially decreased.

There are no boiler repairs caused by scale, no mechanical cleaning necessary with a consequent shutting down of the boilers, blowing out all of the hot water and having to re-heat the water after the boiler is cleaned.

There will be no bagging of sheets or blowing out of tubes with a subsequent shutting down of the boiler for repairs. About one-half as much blowing off is necessary as with hard water.

No boiler compounds are necessary.

No Mystery—Every Step Fully Explained

We operate in the open; tell you exactly what we put into the water and why; tell you what it will cost you per 1000 gallons (usually from 1c to 2c) and make you so thoroughly the master of your own situation that after a plant is installed you have nothing further to buy from us.

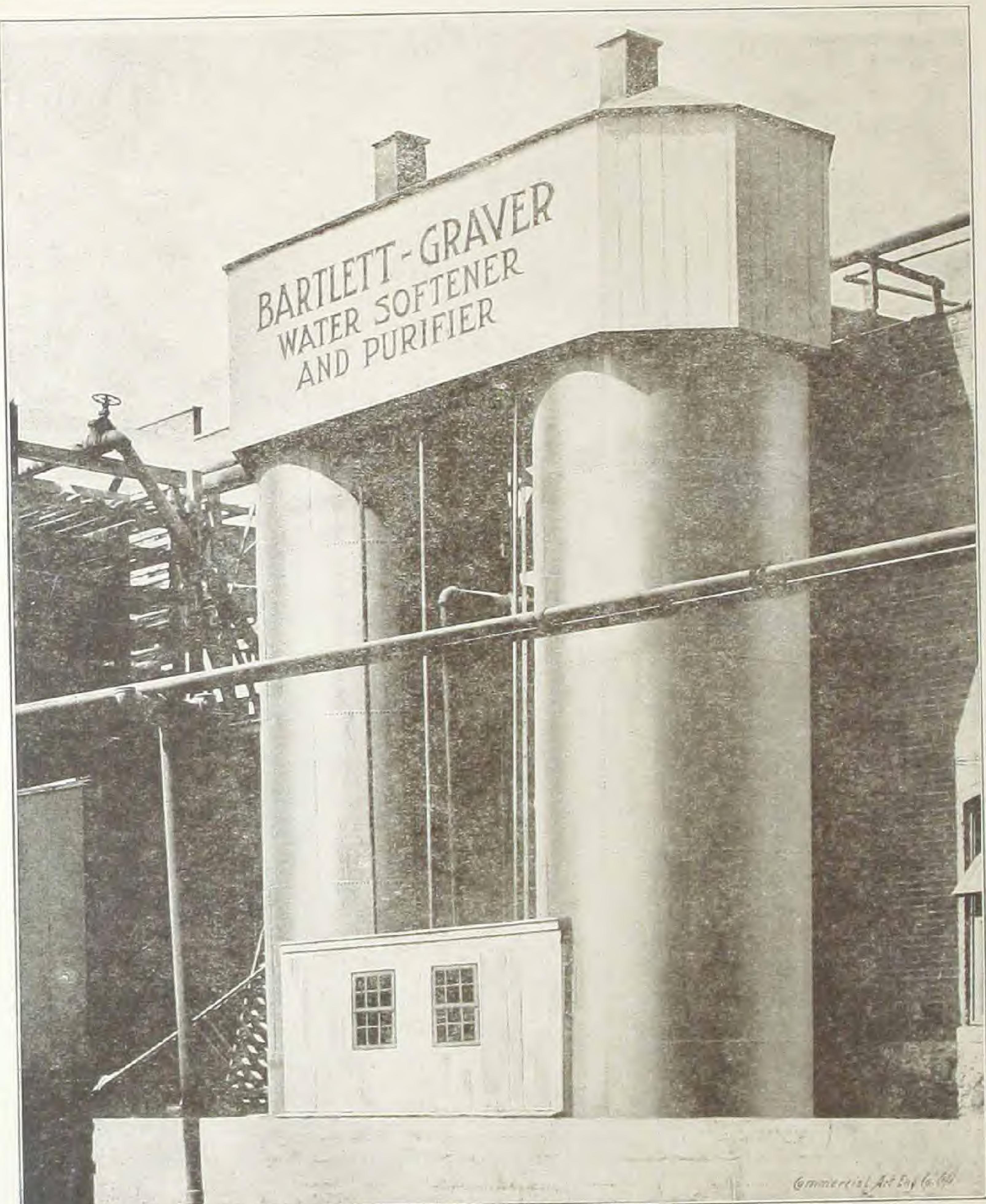
Our experience and our laboratory will be at your disposal, however, if at any time new conditions arise which seem to call for our service.

Ask Those Who Know Best

The pages following are devoted to illustrations of plants in which the Bartlett-Graver System is in use, with letters telling briefly what they accomplish.

It will pay you to make a tour of several of such plants and get further information, first-hand.

BARTLETT-GRAVER WATER SOFTENER



Commercial Art Day 66

CITY ICE AND STORAGE COMPANY Kansas City, Mo.

This softener has a capacity of 6000 gallons per hour and is delivering water to three water tube and five horizontal tubular boilers having a total capacity of 1650 boiler H.P.

The ice plant has a capacity of 300 tons of ice and 26 tons of refrigeration per day. The water is used not only for boiler purposes but also for evaporators. These are kept clean at all times with a resulting increased efficiency to the plant.

IN REPRESENTATIVE ICE PLANTS

H. VANDERSLICE, PRESIDENT
F. D. WHITING, V. PRES. & GEN. MGR.

J. H. LYNN, VICE PRESIDENT
BRUCE DOODSON, VICE PRESIDENT

J. S. CHICK, JR., SECRETARY
J. J. HEIM, TREASURER



TELEPHONES
BELL 555 GRAND
HOME 555 MAIN

OFFICE OF GENERAL MANAGER

THE CITY ICE AND STORAGE CO.

MANUFACTURERS AND DISTILLERS OF
PURE DISTILLED WATER ICE

GENERAL OFFICE 21ST & CAMPBELL STREETS

MANUFACTURING PLANTS:
20TH & CAMPBELL STS.
19TH & OLIVE STS.
17TH & WALDRON STS.
42ND & PENN STS.
6TH & HICKORY STS.
SHEFFIELD

Kansas City, Mo.

August 13, 1913.

Kansas City Engineering Co.,

Kansas City, Mo.

Gentlemen:

Complying with your request we are pleased to say that the Bartlett Graver Water Softener which has now been in operation for several months is giving perfect satisfaction.

Your guarantee of four grains hardness has more than made good, i.e. our boiler feed water averages about two grains hardness and does not vary over one quarter of a grain.

The cost of treatment and operation does not exceed your estimate.

There is no new scale forming in our boilers and the old scale which has been a source of annoyance and heavy expense, is rapidly falling.

We consider your softener a good investment and you may refer prospective customers to us at any time.

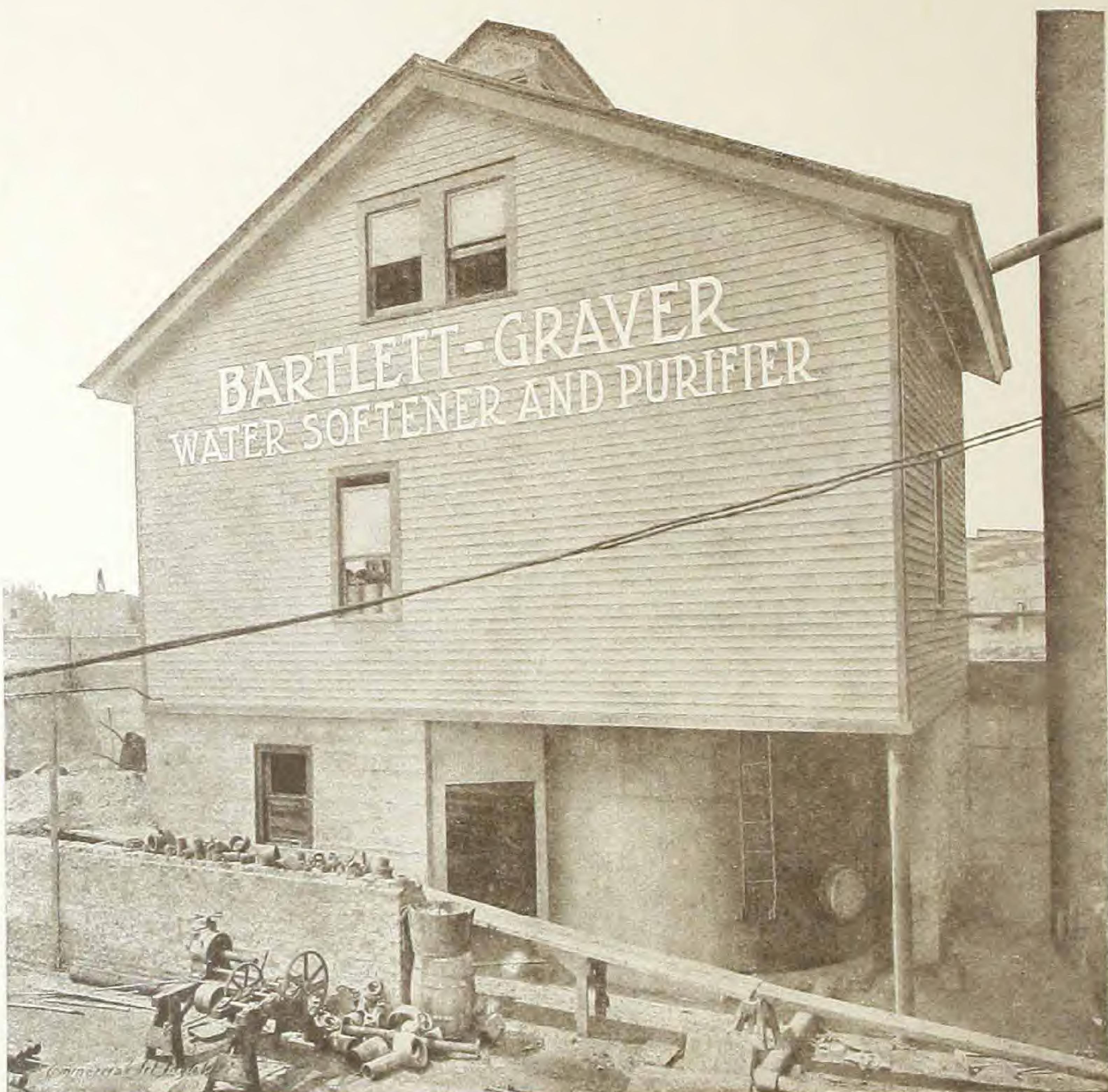
Yours very truly,

THE CITY ICE & STORAGE CO.

By *J. D. Whiting*
Vice-Pres. & Gen. Mgr.

The well water treated by this softener contains about 19 grains of hardening ingredients per U.S. Gallon while the softened water averages about 2 grains per U.S. Gallon. This concern had been troubled to a great extent through the presence of scale and were about at a loss to know how to relieve themselves of this enormous expense of time and money when they heard of the Bartlett-Graver System.

BARTLETT-GRAVER WATER SOFTENER



JAMAICA CONSUMERS HYGEIA ICE COMPANY
Jamaica, N. Y.

This softener has a capacity of 5000 gallons of water per hour for six return tubular boilers developing 900 boiler H.P. The ice plant has a capacity of 270 tons of ice per day.

Before this system was installed boilers had to be cleaned at least every four weeks. Since our installation five months ago, no boiler cleaning has been necessary.

The successful operation of the softener may be judged from the letter on the opposite page by the Chief Engineer of this company.

IN REPRESENTATIVE ICE PLANTS

JAMAICA CONSUMERS ICE CO.

WHOLESALE DEALERS HYGEIA ICE

CAPACITY 300 TONS PER DAY

OFFICE AND PLANT

SOUTH STREET AND NORRIS AVENUE

PHONE 1037 JAMAICA

JAMAICA N.Y.

August 26th, 1913.

Wm. Graver Tank Works,
455 Rookery Bldg.,
Chicago, Ill.

Gentlemen:

Your letter of the 20th at hand. About giving you a letter as to the results of the good work of our softener, I do not know where to start or what to say except that it has done everything you claimed for it as far as we can see. We have run the boilers all summer without cleaning which we could never do before. We never ran a boiler more than four weeks and then we would have to put a man inside to clean it out. This we have not done this season.

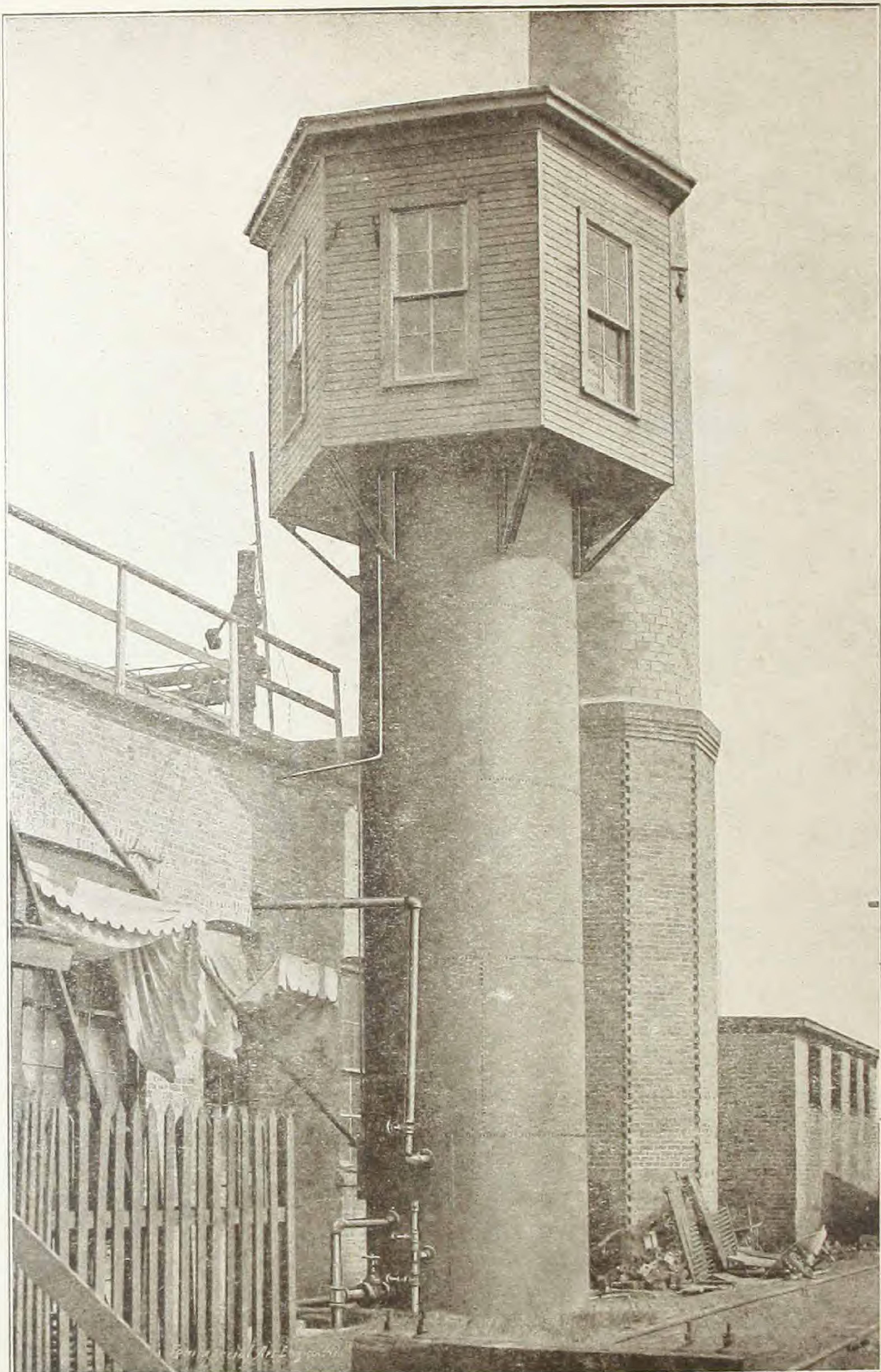
We keep the water to about $1\frac{1}{2}$ grains hardness which shows a very uniform test at all times. It is no trouble to take care of and very easy to clean the filter. If it was not that I test the water every day I would not know the machine was about the place.

Yours respectfully,

J. H. Poole A. C.

The well water treated by this softener contains approximately 10 grains of hardening ingredients per U.S. Gallon while the softened water averages about $1\frac{1}{2}$ grains at all times.

BARTLETT-GRAVER WATER SOFTENER



IN REPRESENTATIVE ICE PLANTS

J. H. MOORES, PRES.

GEO. A. HUTCHINSON, SECY AND TREAS.

THE LANSING PURE ICE COMPANY

MANUFACTURERS OF
DISTILLED WATER ICE

OFFICE AND FACTORY, 911-921 CENTER STREET

LANSING, MICH. Nov. 1st, 1912.

Wm. Graver Tank Works,
Rookery Bldg.,
Chicago, Ill.

Gentlemen:-

Answering your favor of Oct. 29th asking how we were pleased with the Water Softener furnished us by you, would say that we are now getting excellent results, and by the use of the softener are having no trouble with our boiler tubes or other pipes filling up with lime, and our distilled water is especially clear.

Wishing you the best of success, I remain,

Yours very truly,

LANSING PURE ICE COMPANY.

By

J. H. Moore
Pres

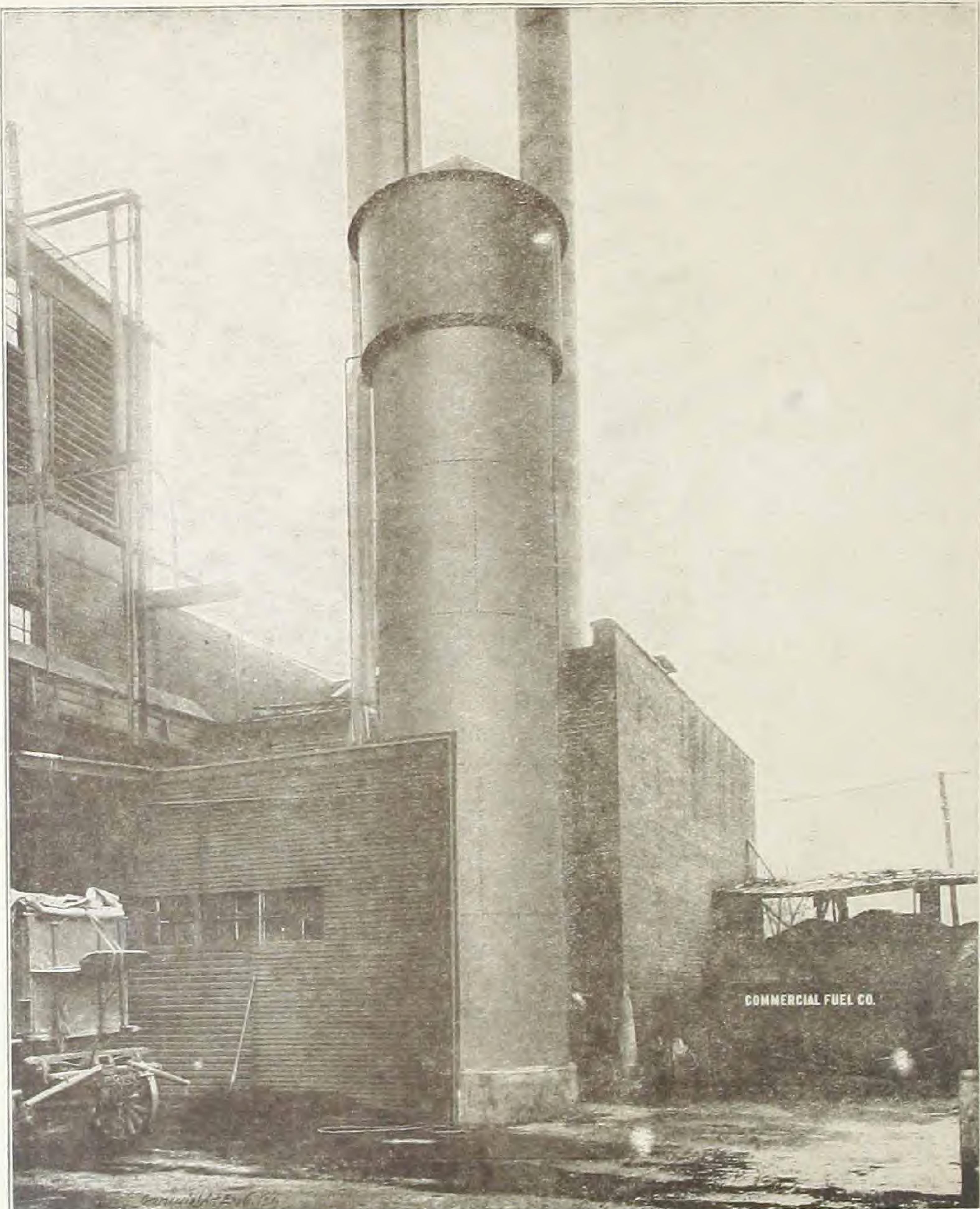
This Softener has a capacity of 2000 gallons of water per hour and is treating water for use in both water tube and return tubular boilers for ice plant having a capacity of 65 tons of distilled water ice per day, in addition to 16,000 cubic feet of cold storage.

The well water treated by this apparatus contains 18 grains of hardening ingredients per U.S. Gallon while the softened water averages from 3 to 4 grains of hardening ingredients per U.S. Gallon.

The installation of the Bartlett-Graver System put an end to a series of costly experiences with bagged boiler tubes and sheets and with scale-choked pipes and heaters.

The softened water delivered by the new system is fed over one unit of the condensors as illustrated in our diagram on page 3 to an enclosed feed water heater, at a temperature average of 140° F.

BARTLETT-GRAVER WATER SOFTENER



ARTIFICIAL ICE AND COLD STORAGE COMPANY
Indianapolis, Ind.

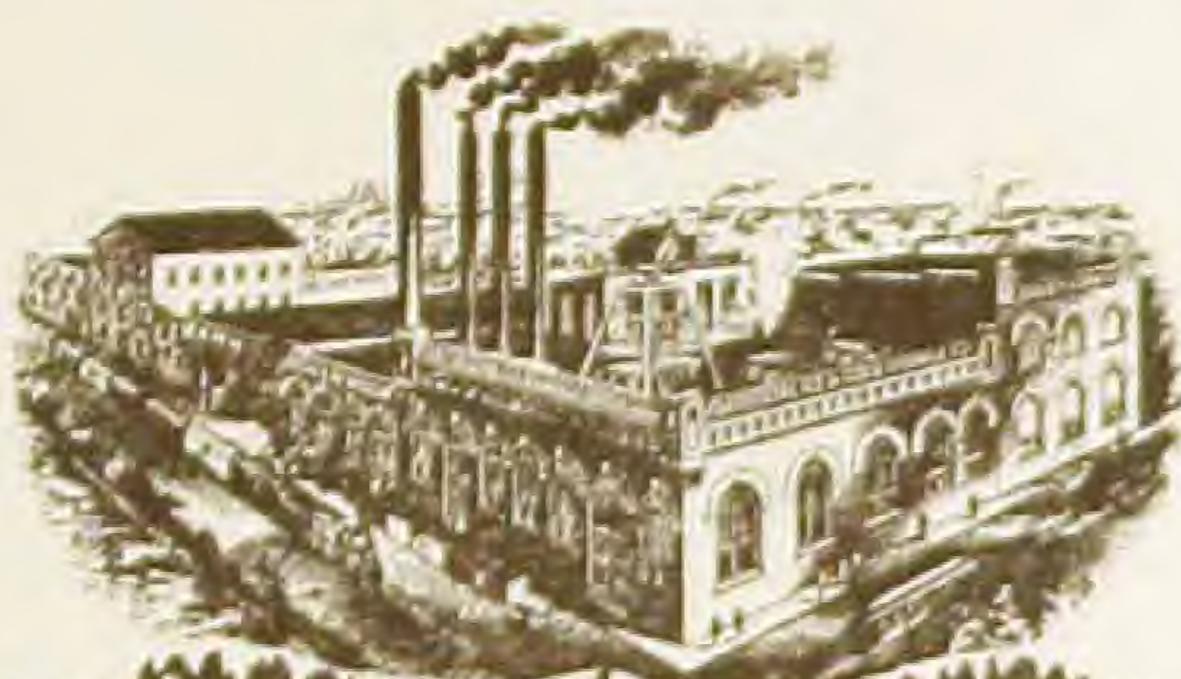
This softener has a capacity of 2000 gallons of water per hour and is treating water for use in Multi-coil heater and return tubular boilers. The ice plant has a capacity of 75 tons of distilled water ice per day.

Well water is treated which has a hardness of approximately 18 grains per U.S. Gallon.

IN REPRESENTATIVE ICE PLANTS

DAILY CAPACITY 150 TONS
STORAGE CAPACITY 20,000 TONS

BOTH PHONES: OLD-MAIN 430
NEW 430



WHOLESALE & RETAIL
DEALERS IN
ARTIFICIAL & NATURAL ICE

MAIN OFFICE 337 W NEW YORK ST

ARTIFICIAL ICE & COLD STORAGE CO.

INDIANAPOLIS, IND. December 9, 1912.

C. W. DODSON, GENERAL MANAGER

Wm. Craver Tank Works,
Chicago, Ill.

Gentlemen:-

In answer to your recent favor inquiring as to our experience with the Bartlett-Craver Water Softener which you installed for us in May of this year, would say that it has proven satisfactory in every respect. Before installing it we were greatly troubled with boiler scale but our boilers are now absolutely clear.

The softener has proven to be simple and easy to operate, requiring very little attention to obtain accurate and uniform results.

Yours very truly,

ARTIFICIAL ICE & COLD STORAGE CO.

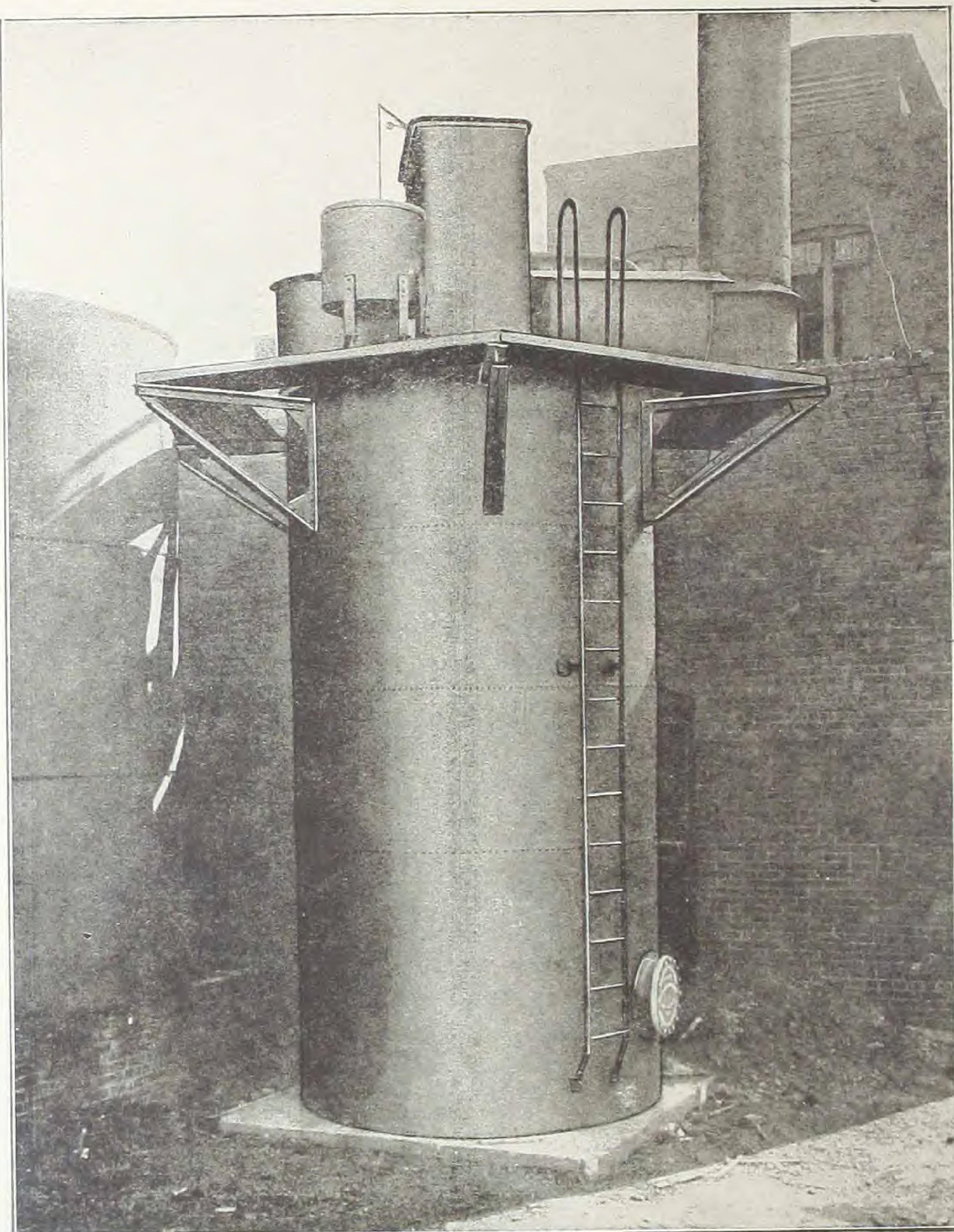
By -

Gen. Manager.

The water is treated so that the boilers are kept absolutely free from scale, black iron being visible at all times according to report of their Chief Engineer.

One of the many reasons why the softener was installed was to obviate the enormous yearly expense for boiler repairs and cleaning. The softener has demonstrated that it practically pays for itself each year by preventing this annual repair expense together with the coal saved.

BARTLETT-GRAVER WATER SOFTENER



PADUCAH ICE COMPANY

Paducah, Ky

This softener has a capacity of 1500 gallons of water per hour and is treating water for 600 boiler H.P. horizontal tubular boilers in conjunction with a standard closed heater. At the present time this softener is treating water for the distilled water part of this plant

IN REPRESENTATIVE ICE PLANTS

ALL AGREEMENTS AND CONTRACTS SUBJECT TO STRIKE, ACCIDENTS, OR OTHER CONTINGENCIES BEYOND OUR CONTROL.

G. CLARK PRESIDENT

F. H. HEDDE, SECRETARY

ROBERT L. HEDDE, TREASURER

PADUCAH ICE COMPANY

WE ARE PROUD OF THE MOST MODERN PLANT
RECENTLY BUILT IN THE WORLD, WHICH
CAN BE COMPARED IN CAPACITY AND COST WITH
ANY OTHER COMPANY AND THEIR EQUIPMENT.

ARTIFICIAL ICE

FROM ARTIFICIAL AND NATURAL
WATER, RIVER, BAY, SEA, LAKES,

SAFETY
ICE MADE FROM RIVER AND STREAMS, AND
IN THE BAY, BAY, BAY, BAY, BAY, BAY, BAY,

PADUCAH, KY., AUGUST 4, 1913.

Mr. Graver Tank Works,
Rockaway Ridge,
Chicago, Ill.

Gentlemen:-

Your letter of the 1st. inst. is received. We don't see how it would be possible to make an apparatus any better than yours. We, of course, at the present time have not been in a position to make raw water ice from this softener, but we will say that for the boiler purposes for which we have been using it, that it is highly satisfactory to us in every particular, low cost for operating, fool-proof, and will say moreover that the writer expects to attend the International Refrigerating Exposition to be held in Chicago during September and it will afford him great pleasure to speak in the highest terms of your apparatus.

Yours respectfully,

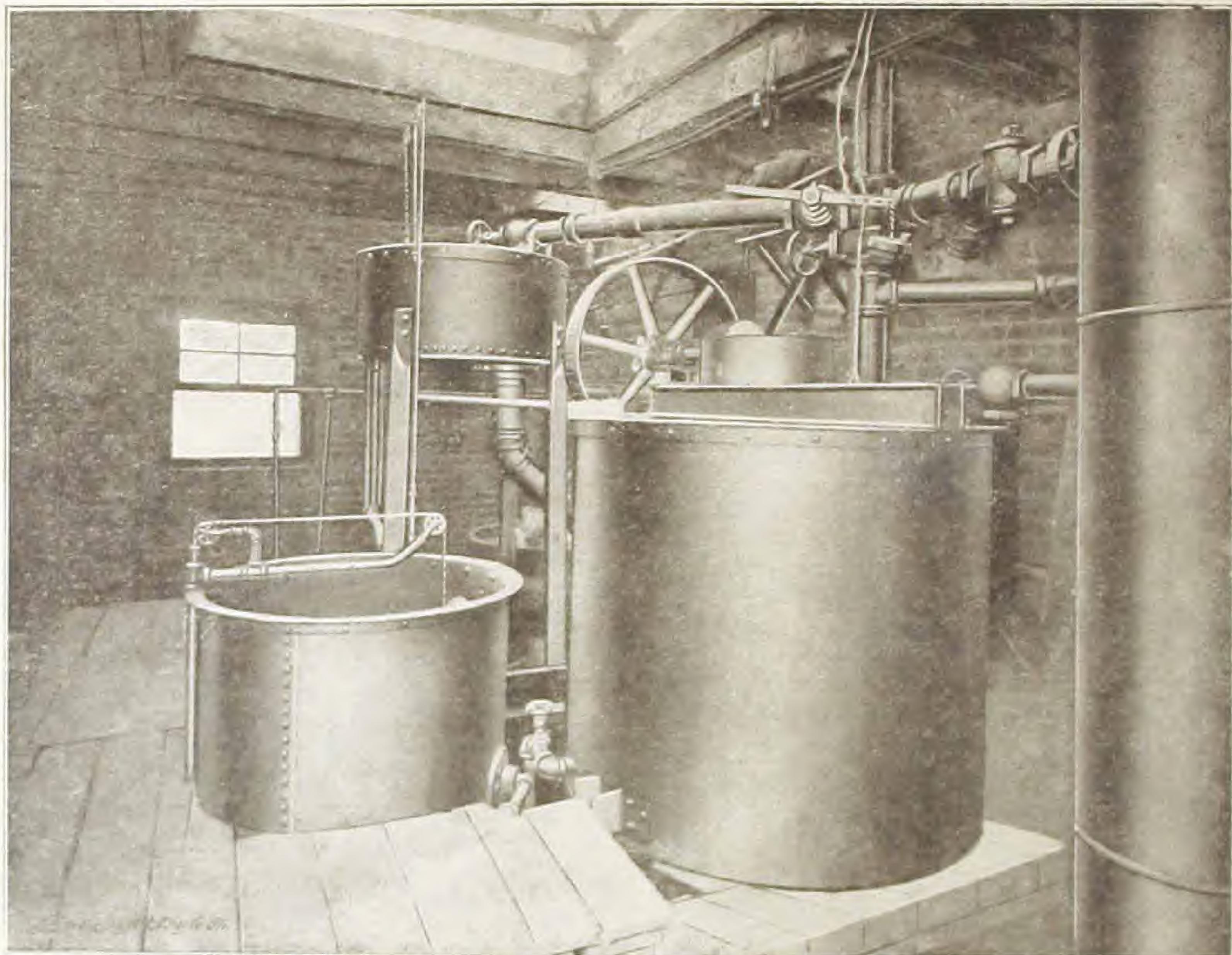
PADUCAH ICE COMPANY.

By - *F. H. H.*, 15

which has a daily capacity of 110 tons of ice. However, extensions are now being made so that the softener will also handle a 40 ton raw water ice plant.

The water is taken from the Tennessee River which contains about 14 grains of hardening ingredients per gallon. The softener not only softens but also purifies this water from a bacteriological standpoint so as to make it absolutely perfect for raw water ice making.

BARTLETT-GRAVER WATER SOFTENER



FLATBUSH-HYGEIA ICE COMPANY
Brooklyn, N. Y.

This photograph shows only the chemical proportioning apparatus of this softener. It replaces the proportioning device of a lime saturator type of softener which has been in operation at this plant for some years. The results varied to such an extent and the labor required to operate the saturator was so great that they replaced it with a Bartlett-Graver System. The results which they are obtaining by this change are related in the letter on the following page:

The raw water as treated by this apparatus averages 19 grains of hardening ingredients per U.S. Gallon while the softened water is maintained at an average of about $3\frac{1}{2}$ grains per U.S. Gallon.

The softener has a capacity of 3500 gallons per hour. It treats water for 500 boiler H.P. The Ice plant has a capacity of 110 tons of distilled water ice per day. Four horizontal tubular boilers and Multi-coil heater are used.

IN REPRESENTATIVE ICE PLANTS

Flatbush Hygeia Ice Company

984-992 Franklin Avenue

Telephone
Connection

Bet. Malbone and Montgomery Streets

Brooklyn, N.Y. Aug. 5th, 1913.

Wm. Graver Tank Works,
Rookery Bldg.,
Chicago, Ill.

Gentlemen:

After a run of almost eight months with the Bartlett-Graver Water Softener, we are pleased to give you our experience as follows.

Previous to installing your water softener we had for a number of years softened our water with a saturated lime water softener and from this experience we are enabled to compare the two systems under actual working conditions. The milk of lime machine (Bartlett-Graver) of 3500 gallons per hour capacity requires the services of a man about fifteen minutes a day as against the lime water machine requiring labor equal to about two hours per day. Furthermore, to clean the scale that used to form and interfere with the operation of the machine, forced us to suspend softening operation for about twelve hours every two weeks.

The softened water after being treated in your machine is always of uniform composition, probably due to the excellent regulation of the feed of chemicals, while with our old softener the softened water would change considerably at different periods due to improper proportioning of the chemicals.

While we had our old softener in operation we had to take out considerable scale from our boilers after our summer run but find since installing yours that our boilers are kept absolutely clean.

We have found so many advantages in your softener as compared to our previous one that we have no hesitancy in giving it our highest endorsement.

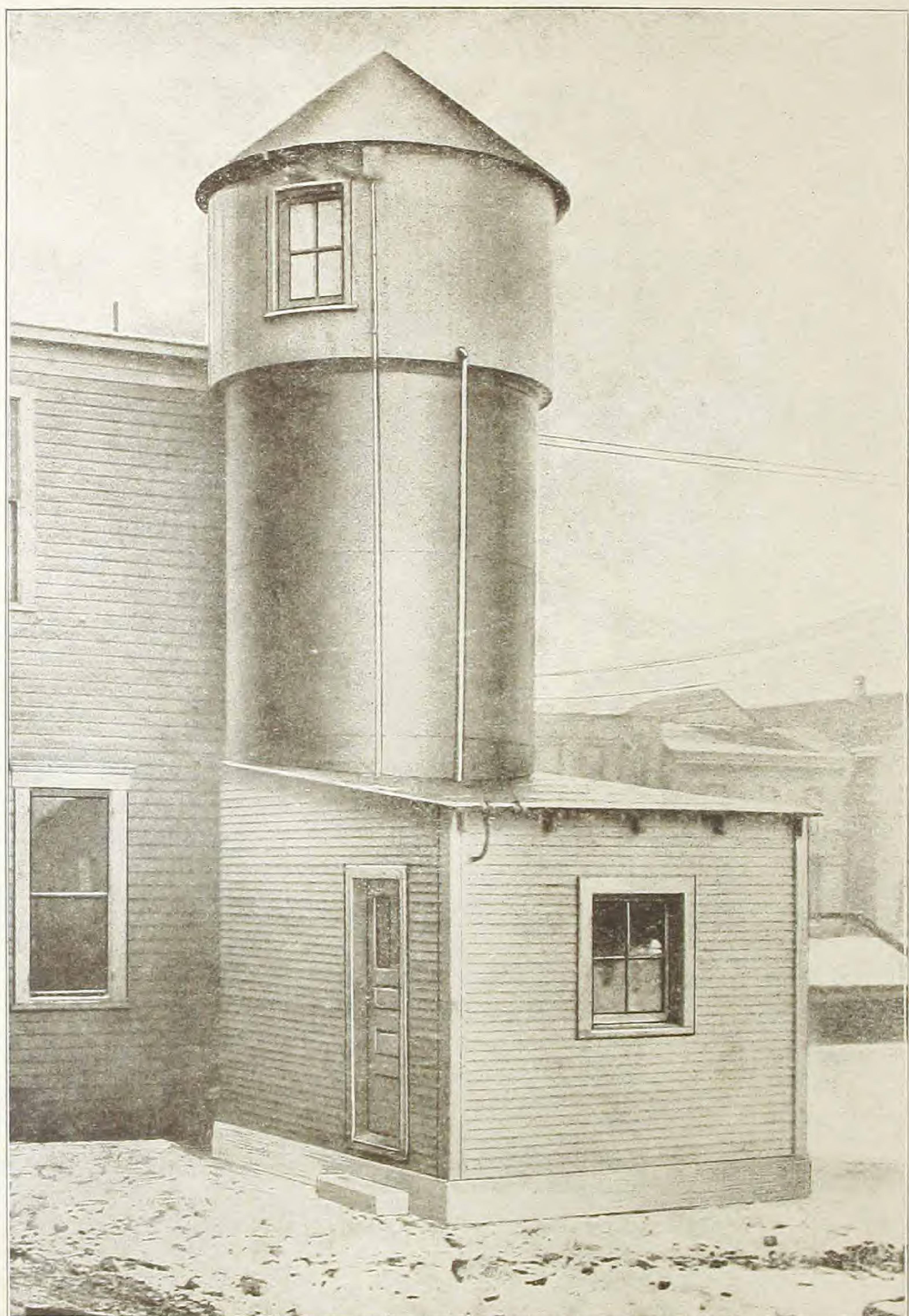
Yours very truly,

FLATBUSH-HYGEIA ICE COMPANY.

By *W.C. Seemann*,
Manager.

This was the first Bartlett-Graver Softener installed in Brooklyn. It was built in December, 1912. Since then three more have been installed in this city and two more are now building.

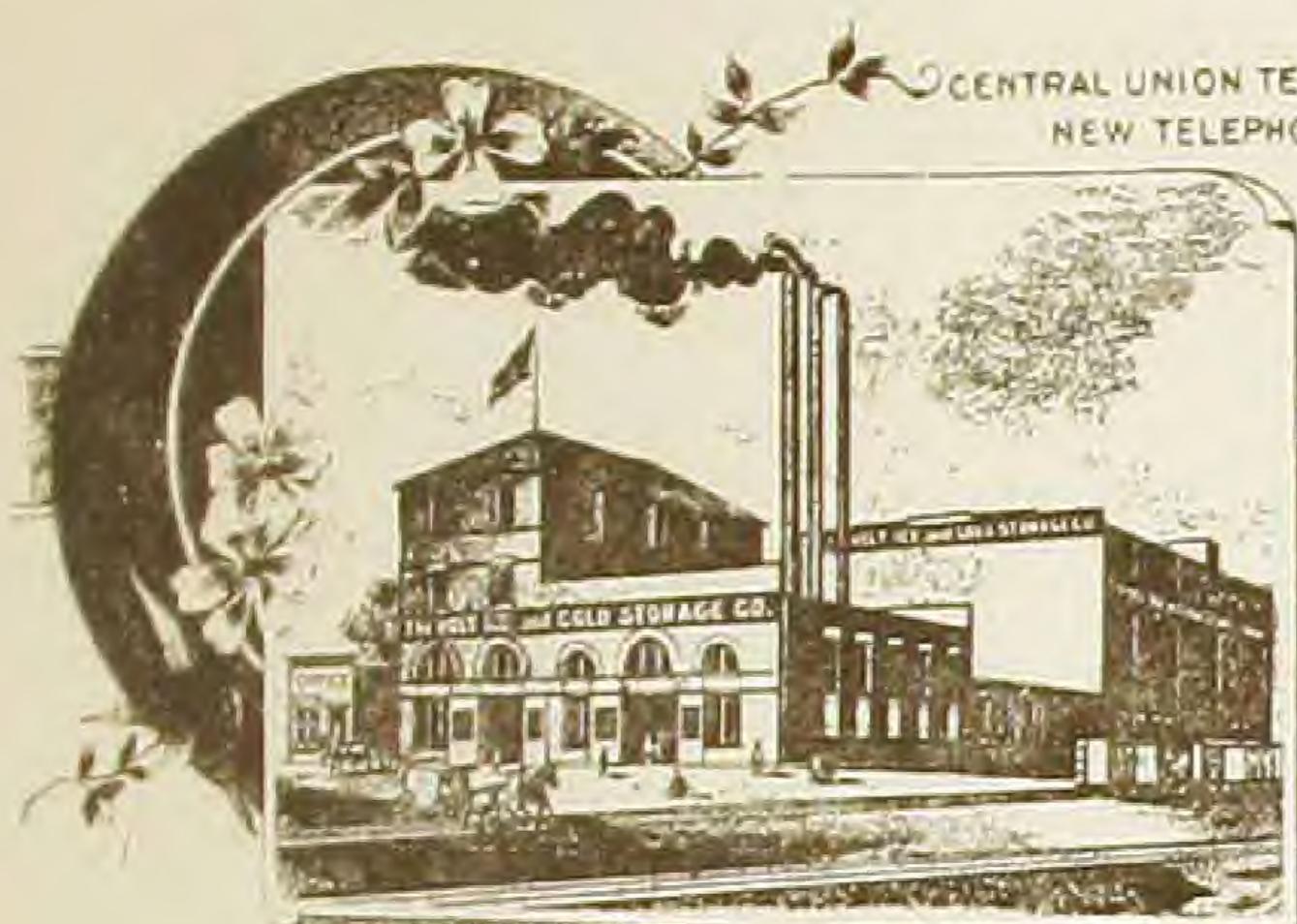
BARTLETT-GRAVER WATER SOFTENER



HOLT ICE AND COLD STORAGE COMPANY

Indianapolis, Ind.

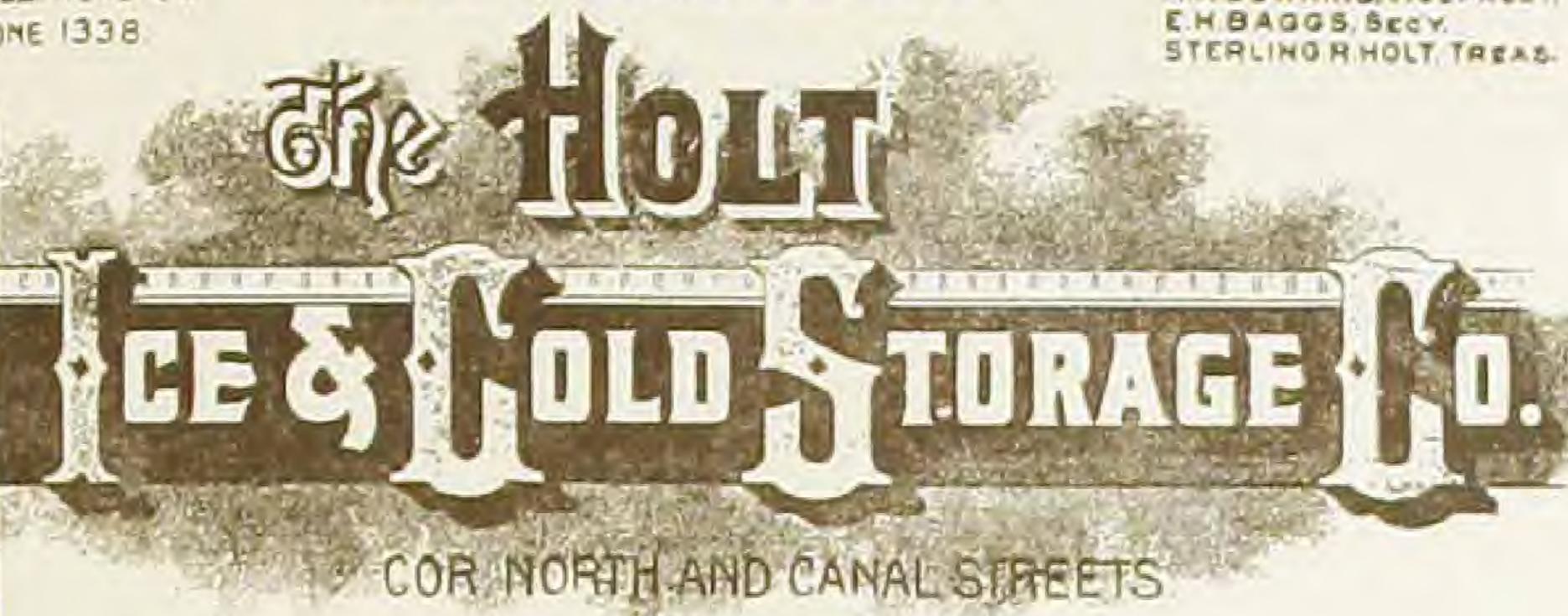
IN REPRESENTATIVE ICE PLANTS



CENTRAL UNION TELEPHONE 102
NEW TELEPHONE 1338

CAPACITY 1,000,000 CUBIC FEET.

W. B. BALLENGER, PRES.
M. ADDONING, VICE PRES.
E. H. BAGGS, Secy.
STERLING R. HOLT, TREAS.



Indianapolis, Ind.

Nov. 1, 1912.

Wm. Graver Tank Works,
Chicago, Illinois.

Gentlemen:

In reply to your favor of recent date regarding our experience with the Bartlett-Graver Water Softener and Purifier, would say that after having had same in operation for a period of ten months, we find it to accomplish, fully, your guarantees.

The softener is used for treating water from which ice is made direct without distillation. Before using the softener it was impossible for us to make anything like clear ice but by the use of softened water the ice which we manufacture compares more than favorably with the distilled water product.

The softener has proven to be simple to operate and extremely accurate and uniform in treatment.

Your quartz filter was an absolute necessity where the water was to be used for direct ice making purposes. In conclusion we would say that we are thoroughly satisfied with the apparatus in every respect.

Yours very truly,

HOLT ICE & COLD STORAGE COMPANY.

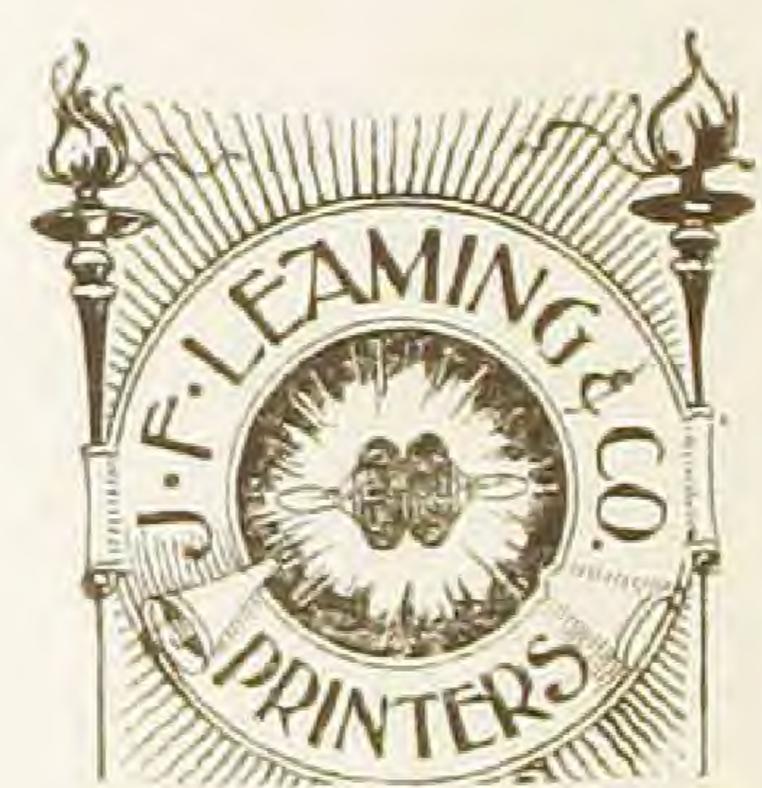
By

President.

This Softener has an hourly capacity of 2000 gallons of water per hour, the treated water being used in the summer time in a 150 ton raw water ice plant and during the winter months in distilled water ice plant.

This is the first water softener ever built for the use of softening water for raw water ice making purposes. Its success is the first demonstration that hard water can be so treated as to make clear raw water ice.

The water treated is from the Indianapolis city supply which varies from 15 to 30 grains of hardening ingredients per U.S. Gallon, depending upon the season of the year.



W. A. 188-9-15-13



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